

NOTICE

All drawings located at the end of the document.

WELL ABANDONMENT AND REPLACEMENT PROGRAM WORK PLAN FISCAL YEAR 1993

U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant
Golden, Colorado

**WELL ABANDONMENT
AND REPLACEMENT
PROGRAM WORK PLAN
FISCAL YEAR 1993**

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Rocky Flats Plant
Golden, Colorado

December 1992

WELL ABANDONMENT AND REPLACEMENT PROGRAM WORK PLAN FISCAL YEAR 1993

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Well Abandonment and Replacement
Program Fiscal Year 1993

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TABLE OF CONTENTS
ENVIRONMENTAL RESTORATION PROGRAM
WELL ABANDONMENT AND REPLACEMENT PROGRAM
FISCAL YEAR 1993 WORK PLAN

<u>Section No.</u>	<u>Title</u>	<u>Rev. No.</u>	<u>Effective Date</u>
ES	Executive Summary	0	05/21/93
	Detailed Table of Contents	0	05/21/93
1.0	Introduction	0	05/21/93
2.0	Well Abandonment and Replacement Procedures	0	05/21/93
3.0	Health and Safety	0	05/21/93
4.0	Quality Assurance Addendum	0	05/21/93
5.0	References	0	05/21/93
APPA	Appendix A: Acronym List	0	05/21/93

EXECUTIVE SUMMARY

The United States Department of Energy (DOE) Rocky Flats Plant (RFP) has initiated a Well Abandonment and Replacement Program (WARP) under the direction of the Environmental Restoration Management (ERM) of EG&G Rocky Flats, Inc. (EG&G). This Well Abandonment and Replacement Program Work Plan (Work Plan) describes the implementation of the next phase of the program in which selected wells will be abandoned or replaced during fiscal year 1993. Implementation of the WARP achieves the general objective of ensuring that groundwater monitoring wells and piezometers are viable. The WARP provides a means to eliminate and selectively replace wells and piezometers where sample and water level readings are suspected of not being representative of subsurface conditions. All WARP field activities will be performed in accordance with applicable Environmental Management Department Operating Procedures, quality assurance guidance, health & safety guidance, and program specific plans.

CONTENT

Page

1.0	INTRODUCTION	1-1
1.1	Statement of Scope	1-1
1.2	Objectives	1-2
1.3	Proposed Well Abandonments and Replacements	1-3
1.4	Project Staffing and Responsibilities	1-5
1.5	Work Location and Site Description	1-7
1.6	Site Conditions	1-9
2.0	WELL ABANDONMENT AND REPLACEMENT PROCEDURES	2-1
2.1	Well Abandonment	2-1
2.1.1	Pre-Abandonment Activities	2-1
2.1.2	Abandonment Methods	2-2
2.1.2.1	Casing Destruction	2-4
2.1.2.2	Pulling Casing	2-4
2.1.2.3	Overdrilling and Overcoring	2-5
2.1.3.4	Abandonment in Place	2-5
2.1.4	Wellbore Grouting	2-6
2.1.5	Surface Protection	2-6
2.2	Well Replacement	2-6
2.2.1	Pre-Drilling Activities	2-6
2.2.2	Borehole Drilling	2-7
2.2.3	Well Installation	2-8
2.3	Equipment Decontamination	2-8
2.4	Environmental Material Handling, Labeling, & Disposal	2-9
2.5	Field Sampling Plan	2-11
2.5.1	Field Sampling Outside the PA	2-11
2.5.2	Field Sampling Inside the PA	2-13
2.6	Permits	2-13
2.7	Field Communications	2-13
2.8	Records and Reports	2-14
3.0	HEALTH AND SAFETY	3-1
4.0	QUALITY ASSURANCE ADDENDUM	4-1
4.1	Organization and Responsibilities	4-1
4.2	Quality Assurance Program	4-2
4.2.1	Training	4-2
4.2.2	Quality Assurance Reports to Management	4-3
4.3	Design Control & Control of Scientific Investigations	4-3
4.3.1	Design Control	4-3
4.3.2	Data Quality Objectives	4-4
4.3.3	Sampling Locations and Sampling Procedures	4-6
4.3.4	Analytical Procedures	4-6
4.3.5	Equipment Decontamination	4-6
4.3.6	Quality Control	4-6

4.3.7	Quality Assurance Monitoring	4-7
4.3.8	Data Reduction, Validation, and Reporting	4-7
4.4	Procurement Document Control	4-7
4.5	Plans, Instructions, Procedures, and Draw	4-8
4.6	Document Control	4-8
4.7	Control of Purchased Items and Services	4-8
4.8	Identification and Control of Items, Samples, and Data	4-9
4.9	Control of Processes	4-9
4.10	Inspection	4-9
4.11	Test Control	4-10
4.12	Control of Measuring and Test Equipment (M&TE)	4-10
4.13	Handling, Storage, and Shipping	4-10
4.14	Status of Inspection, Test, and Operations	4-11
4.15	Control of Nonconformances	4-11
4.16	Corrective Action	4-11
4.17	Quality Assurance Records	4-11
4.18	Quality Verification	4-12
4.19	Software Control	4-12

5.0	REFERENCES	5-1
-----	------------	-----

Appendices

Appendix A	Acronym List	A-1
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Figure

1.4-1	EG&G Rocky Flats, Inc. Management Organization	1-7
1.5-1	Rocky Flats Plant WARP Location Map for FY93	1-8

Table

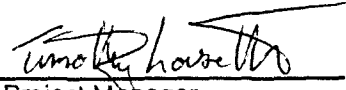
1.3-1	Well Abandonments – FY93 WARP	1-4
2.1.2-1	Well Information Summary for Well Abandonments – FY93 WARP	2-3
2.2-1	Replacement Groundwater Monitoring Wells – FY93 WARP	2-7

ENVIRONMENTAL RESTORATION PROGRAM
Well Abandonment and Replacement Program
Fiscal Year 1993 Work Plan

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Section No.: 1.0, Rev. 0
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Approved by:

 1, 15, 93
Director, Environmental Science and Engineering

 1, 8, 93
Project Manager

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Rocky Flats Plant (RFP) has initiated a Well Abandonment and Replacement Program (WARP) under the direction of the Environmental Restoration Management (ERM) of EG&G Rocky Flats, Inc. (EG&G). During Fiscal Year 1992 (FY92), WARP abandoned 46 groundwater monitoring wells and installed seven replacement groundwater monitoring wells at RFP. This WARP Work Plan describes the implementation of the next phase of the program in which selected wells will be abandoned or replaced during FY93.

1.1 STATEMENT OF SCOPE

The planned scope of work is to abandon 34 wells by one of five abandonment methods. In addition, approximately eight wells will be installed to replace nonviable wells abandoned under WARP. EG&G will determine the sequence and timing for well abandonment and replacement activities and may alter the number of wells to be abandoned and replaced. However, changes in the program are anticipated to be minor and will include only abandonments and replacements that cannot be delayed because of potential harm to groundwater at RFP. Abandonment and replacement activities are discussed in further detail in Section 2.0.

The schedule for implementation of this Work Plan will be provided in the Statement of Work (SOW). The schedule will address the time requirements for implementation of the Work Plan and deliverables from the contract award date.

The subcontractor will prepare and submit a bid package to address the execution of the field work to accomplish well abandonment and replacement, and documentation of abandonment and

replacement procedures. These activities will be performed in compliance with EG&G Environmental Management Division (EMD) Operating Procedures (OPS), the EMD Quality Assurance Project Plan (QAPjP), the RFP Health and Safety Program Plan (HASPP). In addition, WARP shall be implemented under a task-specific Health and Safety Plan (HASP) that shall be prepared by the subcontractor.

The purpose of the Work Plan is to identify and describe the scope of the field activities of the FY93 WARP. These field activities include: (1) abandonment of wells that have been determined are no longer necessary or viable, (2) replacement of non-viable wells for which there is still a need to collect groundwater monitoring data, and (3) collection of subsurface soil samples during the drilling of replacement wells. These samples may be used to generate analytical data for use by other ER program projects and to assist in determining the presence and extent of contamination. Requirements and controls for analyses of soil samples is addressed in operable unit (OU) specific work plans where data will be used to assist in determining the presence and extent of contamination.

1.2 OBJECTIVES

WARP is a maintenance program for the groundwater monitoring program (GMP) at RFP. Implementation of WARP achieves the general objective of ensuring the viability of groundwater monitoring wells and piezometers. WARP provides a means to eliminate and selectively replace wells and piezometers where sample and water level readings are suspected of not being representative of subsurface conditions. GT.11, "Plugging and Abandonment of Wells," identifies the following as general objectives of well abandonment:

- Prevention of Groundwater and Soil Contamination through the Well,
- Prevention of Intermixing of Subsurface Water through the Well,
- Conservation of Hydraulic Characteristics of Hydrogeologic Units, and

- Minimization of Physical Hazards.

The specific objectives of WARP is to meet the following goals:

- Properly abandon nonviable wells and piezometers using procedures which protect groundwater from contamination.
- Install replacement wells and piezometers at locations where a nonviable but useful well or piezometer is removed.

1.3 PROPOSED WELL ABANDONMENTS AND REPLACEMENTS

Table 1.3-1 lists the groundwater monitoring wells proposed for abandonment at RFP. The criteria used to identify wells that are no longer viable or useful to GMP include insufficient well construction data, well damage, casing obstruction, improper construction, and insufficient water to collect analytical samples during the past eight quarters. All wells at RFP known to meet criteria of insufficient well construction data, well damage, casing obstruction and improper construction are presented in Table 1.3-1. The wells proposed for abandonment because of insufficient water were determined to have no other possible use. Some dry wells at RFP will be used for vadose monitoring or possibly as well points for soil vapor extraction. Until future uses can be determined, these other dry wells will not be proposed for abandonment.

Monitoring wells 0371, 0471, 1374, 1774, 1874, and 0381 are unclassified and are not in the current groundwater monitoring program. No replacement wells are proposed for groundwater monitoring at these locations. Boundary monitoring well 0486 is redundant and has been replaced by existing monitoring well 41691. Background monitoring wells B201489, B301889, B203689, B304289, and B204689 have fulfilled the original objectives of background monitoring. Therefore, background replacement wells are not proposed. Special

Table 1.3-1 Well Abandonments – FY93 WARP

Well No.	Well Class	Reason for Abandonment	Replace?	Reason Not To Replace	Existing Well
0371		Insufficient Data	No	Not Used	
0471		Insufficient Data	No	Not Used	
1374		Insufficient Data	No	Not Used	
1474	CERCLA	Insufficient Data	No	Redundant	5686
1574		Insufficient Data	Yes		
1674	CERCLA	Insufficient Data	Yes		
1774		Insufficient Data	No	Not Used	
1874		Insufficient Data	No	Not Used	
0181	CERCLA	Insufficient Data	No	Redundant	0586
0281	CERCLA	Insufficient Data	No	Redundant	41091
0381		Insufficient Data	No	Not Used	
0486	Boundary	Damaged	No	Redundant	41691
1186	CERCLA	Damaged	No	Redundant	41091
1286	CERCLA	Flooding	No	Redundant	40991
2086	RCRA	Damaged/Insuff Water	No	Dry	
2886	RCRA	Damaged	Yes		
4586	CERCLA	Damaged	Yes		
1787	CERCLA	Damaged	No	Redundant	P219989
3787	RCRA	Damaged	Yes		
5987	RCRA	Damaged	No	Redundant	B106089
6387	RCRA	Damaged	No	Redundant	6187
6787	RCRA	Damaged	Yes		
B201489	Background	Insufficient Water	No	Program Complete	
B301889	Background	Insufficient Water	No	Program Complete	
B203689	Background	Damaged	No	Program Complete	
B304289	Background	Damaged	No	Program Complete	
B204689	Background	Casing Obstruction	No	Program Complete	
B206189	RCRA	Improper Construction	No	Redundant	6289
B207189	RCRA	Casing Obstruction	No	Redundant	4187BR
P207489	RCRA	Improper Construction	Yes		
P210289	RCRA	Damaged	Yes		
0490	Special Purpose	Damaged	No	Program Complete	
20091	Special Purpose	Improper Construction	No	Program Complete	
39991	CERCLA	Damaged	No	Redundant	10192

Purpose Monitoring Well 0490 and 20091 have fulfilled the original objectives of "characterization" monitoring. Therefore, replacement of these special purpose wells is not proposed. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) monitoring wells 1474, 0181, 0281, 1186, 1286, 1787, and 39991 are redundant and replacement wells are not proposed. Table 1.3-1 identifies the existing wells that duplicate the function of these CERCLA wells.

Resource Conservation and Recovery Act (RCRA) monitoring wells 5987, 6387, B206189, and B207189 are redundant and replacement wells are not proposed. Table 1.3-1 identifies the existing monitoring wells that duplicate the function of these RCRA wells. RCRA monitoring well 2086 was installed near the French Drain Collection System, northwest of the Solar Ponds. A replacement well is not proposed because dewatering by the french drain has caused the alluvium to become unsaturated in this area.

Groundwater monitoring wells 1574, 1674, 2886, 4586, 3787, 6787, P207189, P207489, and P210289 will be replaced because continued monitoring at these locations is required to meet the objectives of current programs.

1.4 PROJECT STAFFING AND RESPONSIBILITIES

Implementation of WARP will be done by EG&G employees and subcontractors. Figure 1.4-1 an EG&G organization chart indicating the relative positions of authority regarding the management of WARP. Key project positions and responsibilities include:

- **EG&G Project Manager** – The EG&G project officer is the primary interface between the subcontractor, EG&G, and DOE. The project officer communicates with the subcontractor project manager or the project manager designee as required, and provides overall project direction from EG&G and DOE.
- **Subcontractor Project Manager** – The project manager is responsible for coordinating project activities and providing managerial and technical support to help ensure that schedules

are met and necessary resources are available to conduct the project. The project manager is the point of contact for the EG&G project officer concerning project scope, technical direction, schedule, and budget.

- **Subcontractor Quality Assurance (QA) Office** – The QA officer evaluates the task for quality requirements in compliance with QAPjP and standards of professional practice. The QA officer approves all documents addressing quality parameters, conducts orientations, and performs reviews and audits of field activities, project records, and other functions that potentially affect project quality.
- **Subcontractor Health and Safety Officer** – The health and safety officer provides oversight and direction, and performs audits to help ensure adherence to the health and safety requirements of the RFP HASPP, the task-specific HASP, and the professional standards of practice.
- **Subcontractor Field Supervisor** – The field supervisor is responsible for supervising the project field activities of the site geologists. The field supervisor will be the primary contact for matters of routine project field operations, and will interface with the EG&G project officer or the project officer designees on operational and technical decisions requiring EG&G or DOE input. The field supervisor will keep EG&G apprised of project progress on a day-to-day basis. The field supervisor will also perform project support tasks as necessary, including geologic sample logging and analytical sample preparation and shipping.
- **Subcontractor Site Geologist** – A site geologist will supervise subcontractor drilling crews and conduct project field operations on a day-to-day basis. The site geologist will be responsible for compliance with the requirements of this work plan and other applicable project documents, including completion of all field forms. The site geologist will maintain and operate field instruments and equipment, including field radiation screening instruments, and will identify equipment that is not operating properly. The site geologist will conduct a variety of support tasks that help ensure that facilities, equipment, supplies, vehicles, and records are of high quality for job performance.

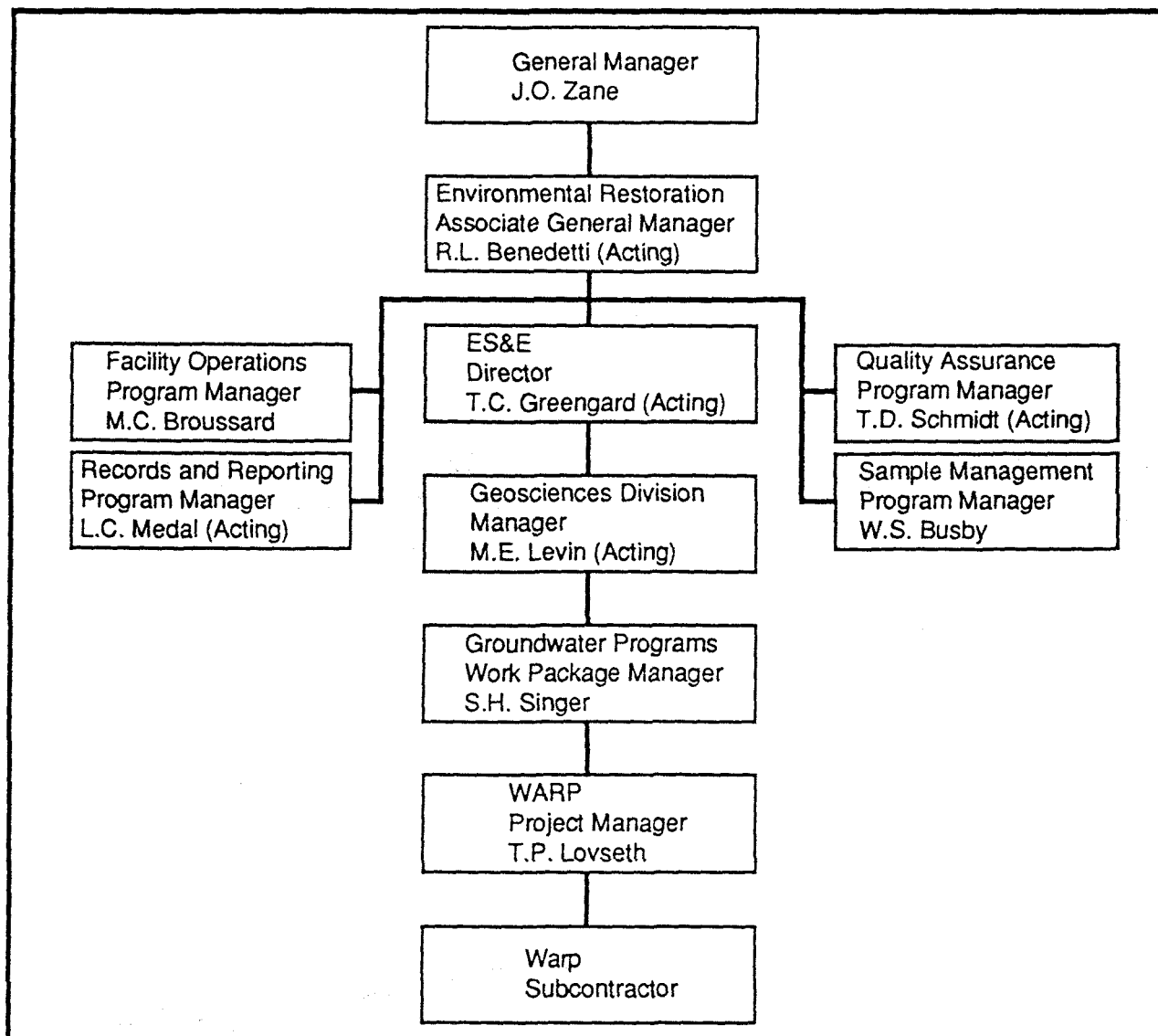


Figure 1.4-1 EG&G Rocky Flats, Inc. Management Organization

1.5 WORK LOCATION AND SITE DESCRIPTION

RFP operations have generated nonhazardous, hazardous, radioactive, and mixed radioactive waste and these types of wastes may be encountered in the subsurface. All the groundwater monitoring wells proposed for abandonment or replacement are located within the site perimeter of RFP which includes about 6,550 acres. RFP is divided into three security zones (See Fig. 1.5-1).

The major RFP structures, including all former production buildings, are located within the 400-acre Plant Security Zone (i.e., controlled area). Within the controlled area is the Protected Area (PA), which surrounds the most sensitive former production areas of RFP. The controlled area is surrounded by a 6,150-acre Buffer Zone.

The 34 wells to be abandoned (See Fig. 1.5-1) include five wells in the PA and 29 wells in the Buffer Zone. Four replacement monitoring wells will be installed in the PA and four replacement wells will be installed in the Buffer Zone. Access requirements and operating procedures vary widely between these zones.

Eight of the wells to be abandoned are located in Individual Hazardous Substance Sites (IHSSs). IHSS locations and well locations are identified in Plate 1 of the November 27, 1991 report entitled "Groundwater Protection and Monitoring Program Plan."

1.6 SITE CONDITIONS

The plantsite is situated on a broad, eastward-sloping pediment that is capped by alluvial deposits of Quaternary age. At RFP, the pediment surface is dissected by a series of east-northeast trending stream-cut valleys. These valleys lie 50 to 200-feet below the level of the older pediment surface. Approximately 11 out of the 34 wells proposed for abandonment are located in valleys which are only accessible by vehicles with all-terrain capabilities. The valleys are incised into the bedrock underlying alluvial deposits, but most bedrock is concealed beneath colluvial material accumulated along the gentle valley slopes.

The geology of RFP has been described in the July 31, 1991 report entitled "Geologic Characterization" and the March, 1992 report entitled "Phase II Geologic Characterization, Data Acquisition." These reports provide detailed descriptions of the soils and rock units found in the subsurface at RFP. In addition, boring logs exist for all of the proposed groundwater monitoring wells to be abandoned except for those wells installed before 1986. These boring logs will be made available to the subcontractor.


ENVIRONMENTAL RESTORATION PROGRAM
Well Abandonment and Replacement Program
Fiscal Year 1993 Work Plan

Manual:
Section No.:
Page:
Effective Date:


21000-WP-WARP.93
1.0, Rev. 0
10 of 10
2/1/93

The groundwater conditions at RFP have been described in the November 27, 1991 report entitled "Groundwater Protection and Monitoring Program Plan." Groundwater at RFP occurs under confined and unconfined conditions.

Approved by:


Director, Environmental Science and Engineering

1, 15, 93


Project Manager

1, 8, 93

2.0 WELL ABANDONMENT AND REPLACEMENT PROCEDURES

The following sections address well abandonment and replacement procedures, RFP access, reporting and documentation, permitting requirements, and field communications as they pertain to WARP. Activities to be conducted under WARP will be conducted in accordance with EM Standard Operating Procedures (OPS), which are incorporated by reference into the work plan.

2.1 WELL ABANDONMENT

Instructions for well abandonment activities are described in OPS-GT.11, "Plugging and Abandonment of Wells." The following sections address key elements of GT.11 and other relevant OPSs as they apply to WARP. Decontamination and environmental material handling procedures pertaining to well abandonment activities are addressed in Sections 2.3 and 2.4.

2.1.1 Pre-Abandonment Activities

Pre-abandonment activities, including radiation screening and work site preparation, will be conducted at each abandonment site in accordance with the RFP HASP, the task-specific HASP, GT.11, and FO.16, "Field Radiological Measurements." In addition, the following pre-abandonment activities not specifically addressed in the OPS will be necessary:

- 1) Measure and record groundwater level and total depth of the well. Calculate the volume of water contained within the well to ensure the construction of an amply sufficient waste liquid containment structure as described in GT.11.

- 2) Break up and remove the concrete well pad as specified in GT.11. Remove the protective casing as specified in GT.11.

2.1.2 Abandonment Methods

Wells shall be abandoned by one of five methods in accordance with GT.11:

- 1) Casing Pulling
- 2) Casing Destruction (Drilling Out Casing)
- 3) Overdrilling
- 4) Overcoring
- 5) Abandonment in Place (without Casing Removal).

Under WARP, all wells except monitoring well B204689 will be abandoned by one of the four methods mentioned above which will involve physical removal of well casing and annular completion materials. Annular materials are removed to promote a good seal between the wellbore wall and the grout used to fill and plug the wellbore. Abandonment without casing removal will be used on this project for monitoring well B204689 because a pump and tubing are stuck in the casing, preventing casing removal. However, an attempt to remove the casing obstructions in monitoring wells B204689 and B207189 will be made using fishing tools and the drilling rig before the commencement of abandonment activities.

Table 2.1.2-1 lists relevant well data and proposed methods of abandonment for each of the 34 wells. It is recognized that the planned abandonment method for a given well may need to be reconsidered if unexpected conditions (i.e., damaged or obstructed casing) are encountered. The appropriate method(s) of abandonment for a particular well depend upon well construction details and hydrogeologic setting.

Table 2.1.2-1 Well Information Summary for Well Abandonments – FY93 WARP

Well No.	State North	State East	Zone of Completion	Total Depth	Casing Material	CSG Diameter	Abandon Method
0371	752022	2087035	Unknown	30.7	Steel	6	Overdrill
0471	747861	2086138	Unknown	22.3	Steel	6	Pull
1374	747113	2080171	Unknown	19.2	PVC	6	CSG Destruct
1474	747123	2080091	Unknown	4.6	PVC	6	CSG Destruct
1574	747672	2088363	Unknown	19.3	PVC	6	CSG Destruct
1674	747721	2088282	Unknown	4.3	PVC	6	CSG Destruct
1774	751170	2088515	Unknown	14.3	PVC	6	CSG Destruct
1874	751130	2088503	Unknown	6.4	PVC	6	CSG Destruct
0181	753293	2090201	Unknown	20.3	PVC	6	CSG Destruct
0281	753678	2089849	Unknown	20.1	PVC	6	CSG Destruct
0381	751270	2088580	Unknown	21.2	PVC	6	CSG Destruct
0486	753439	2093878	Alluvium	14.6	Steel	2	Pull
1186	753323	2090035	Alluvium	10.25	Steel	2	Pull
1286	752345	2087894	Alluvium	11.3	Steel	2	Pull
2086	751112	2084358	Alluvium	10.55	Steel	2	Pull
2886	750818	2085241	Alluvium	8.6	Steel	2	Pull
4586	750316	2079469	Alluvium	48.2	Steel	2	Overdrill
1787	749415	2086308	Alluvium	25.75	Steel	2	Pull
3787	750494	2085224	Alluvium	9	Steel	2	Pull
5987	752313	2082563	Alluvium	21.2	Steel	2	Pull
6387	752717	2083138	Alluvium	25.2	Steel	2	Pull
6787	753164	2083774	Alluvium	16.8	Steel	2	Pull
B201489	757078	2085337	Alluvium	11.64	PVC	4.5	CSG Destruct
B301889	747310	2085322	Alluvium	24.5	PVC	4.5	CSG Destruct
B203689	756745	2086570	Bedrock	37.3	PVC	4.5	CSG Destruct
B304289	744679	2086215	Bedrock	90.95	PVC	2.4	CSG Destruct
B204689	754788	2086657	Bedrock	112.22	PVC	2.4	Abn in Place
B206189	752332	2083301	Bedrock	36.61	PVC	4.5	CSG Destruct
B207189	753267	2084837	Bedrock	77.8	PVC	2.4	CSG Destruct
P207489	750197	2084481	Alluvium	8.23	PVC	4.5	CSG Destruct
P210289	750564	2085223	Bedrock	22.27	PVC	4.5	CSG Destruct
0490	751862	2079635	Alluvium	60	PVC	2	CSG Destruct
20091	750056	2087603	Bedrock	57.2	PVC	2	CSG Destruct
39991	747689	2083972	Alluvium	20.7	PVC	4	CSG Destruct

Some wells scheduled for abandonment may have been drilled much deeper than the present total depth, then plugged back and completed in a shallower zone. If grout is encountered immediately beneath the casing, drilling or reaming activities will be terminated. If sand pack or backfill is present below the current total depth, it will be removed by reaming or drilling to the original total depth or until grout is encountered. The grouted interval is considered to be previously abandoned, therefore, reaming or drilling through the grout is not necessary.

2.1.2.1 Casing Destruction

Casing destruction can be used only on wells with polyvinyl chloride (PVC) well casing. This method involves drilling out of the well casing and annular completion materials with a rotary drill bit or auger. Approximately 20 wells are proposed for abandonment by this method (See Table 2.1.2-1) based on their PVC well casing. Procedures for drilling out casing are provided in GT.11. The site geologist will determine through a cuttings examination when all annular materials have been reamed from the borehole.

2.1.2.2 Pulling Casing

Wells with steel, stainless steel, or cast iron casings shallower than 30-feet total depth can potentially be abandoned by casing pulling. Approximately 12 wells are proposed for abandonment by casing pulling (See Table 2.1.2-1). It is possible that casings in some of these wells will exceed the available lifting capabilities, making it necessary to resort to overdrilling or overcoring. Procedures for pulling casing are provided in GT.11. In order to perform the activities spelled out in GT.11, it will be necessary to attach the well casing to the drilling rig hydraulic feed or the hydraulic jack. The appropriate method for accomplishing this will be determined by field personnel based on existing conditions at the particular well. The site geologist will determine through cuttings examination when all annular materials have been reamed from the borehole.

2.1.2.3 Overdrilling and Overcoring

Overdrilling and overcoring employ a hollow-stem auger (i.e., overdrilling) or coring bit (i.e., overcoring) to remove annular materials from around the casing, isolating and freeing it for removal. The only fundamental difference between the two methods is the drilling technique used. Overdrilling, which typically is much less time-consuming than overcoring, can be used only on relatively shallow wells where the casing is embedded in soft or unconsolidated materials. Overcoring is used, as necessary, on deeper wells and/or where the casing is embedded in consolidated rock. The decision on which of the two methods to use will be made in the field by drilling crews. In most situations, overdrilling may be used to a certain depth, at which time the rig will switch to overcoring.

Two wells are proposed for abandonment by overdrilling and/or overcoring (See Table 2.1.2-1). Procedures for overdrilling and overcoring are provided in GT.11. The site geologist will determine through a cuttings examination when all annular materials have been reamed from the borehole.

2.1.3.4 Abandonment in Place

Monitoring Well B204689 will be abandoned in place because of a pump stuck in the casing at about 112-feet. The casing interval above the pump will be filled with bentonite grout to about 60-feet below ground surface. To avoid sticking the tremie pipe, an attempt will not be made to tremie grout below the pump. Above 60-feet, the casing will be drilled out and the borehole will be filled with bentonite grout. Casing destruction above 60-feet will allow an adequate interval for the emplacement of a grout plug.

2.1.4 Wellbore Grouting

After casing removal, abandoned wellbores will be grouted in accordance with the detailed procedures in GT.5, "Plugging and Abandonment of Boreholes."

2.1.5 Surface Protection

Surface protection features for abandoned wells are addressed in GT.11. This includes the construction of a concrete slab at the surface of each abandoned wellsite. This slab will require preparation of a form with inside diameter or dimensions at least 2-feet greater than the diameter of the wellbore. The form will be placed on the ground surface around the wellbore, and the ground surface within the form will be excavated to a depth of 4 to 6-inches. Excavated soil will not be allowed to fall into the wellbore. A permanent stainless steel marker will be affixed to each concrete slab.

2.2 WELL REPLACEMENT

Replacement wells are planned for approximately eight of the 34 wells abandoned under WARP (See Table 2.2-1). The replacement well borings will be drilled in accordance with GT.02, "Drilling and Sampling Using Hollow-stem Auger Techniques". Decontamination and waste handling procedures pertaining to well replacement are addressed in Sections 2.3 and 2.4.

2.2.1 Pre-Drilling Activities

Before drilling replacement wells, well locations will be cleared in accordance with GT.10, "Borehole Clearing," and marked in accordance with GT.2, "Drilling and Sampling Using Hollow-Stem Auger Techniques." A prework radiological survey will be conducted in accordance with FO.16, "Field Radiological Measurements." Required permits will be obtained as described in

Section 2.6. All necessary health and safety protocols will be followed in accordance with the RFP HASPP and the task-specific HASP prepared by the subcontractor.

Table 2.2-1 Replacement Groundwater Monitoring Wells – FY93 WARP

Order of Placement	Well To Be Replaced	Projected Total Depth (ft)	Zone of Completion
8	1574	8	Alluvium
7	1674	20	Bedrock
1	2886	10	Alluvium
6	4586	50	Alluvium
2	3787	11	Alluvium
5	6787	17	Alluvium
3	P207489	11	Alluvium
4	P210289	25	Bedrock

2.2.2 Borehole Drilling

Replacement well boreholes will be drilled using hollow-stem auger techniques whenever possible. Detailed hollow-stem auger drilling and sampling procedures are provided in GT.2, "Drilling and Sampling Using Hollow-Stem Auger Techniques." If necessary in harder bedrock intervals or in cobbly surficial deposits, the wellbore will be rock cored per GT.4, "Rotary Drilling and Rock Coring."

Borehole samples collected during implementation of the Field Sampling Plan as described in Section 2.5, will be handled in accordance with FO.13, "Containerization, Preserving, Handling, and Shipping of Soil and Water Samples," and logged per GT.1, "Logging Alluvial and Bedrock Material." Detailed sample logging will be performed by the field supervisor.

2.2.3 Well Installation

All eight groundwater monitoring wells will be installed in accordance with GT.06, "Monitoring Wells and Piezometer Installation." Because all wells will be completed in the Upper Hydrostratigraphic Unit, single casing well construction designs will be used. Double casing (i.e., a separate surface casing) as specified in GT.03, "Isolating Bedrock from Alluvium with Grouted Surface Casing," will not be required for the shallow bedrock wells. This is because the bedrock completion zone is not in hydraulic connection with lower hydrostratigraphic units and the depth of weathering is beyond the proposed total depth of the wells. These conclusions are based on the examination of boring logs from existing Monitoring Wells P210289 and 3087BR.

2.3 EQUIPMENT DECONTAMINATION

Equipment used for WARP field operations will be decontaminated in accordance with FO.3, "General Equipment Decontamination," and FO.4, "Heavy Equipment Decontamination." Decontamination activities requiring the use of the RFP Main Decontamination Facility (MDF) will be performed per the requirements of FO.12, "Decontamination Facility Operations." Other OPS cross-referenced in FO.3, FO.4, and FO.12 contain any additional applicable equipment-specific decontamination guidance.

Decontamination procedures will be implemented to minimize:

- Potential Crosscontamination,
- Offsite Contaminant Migration,
- Personnel Exposure from Improperly Decontaminated Equipment.

The site geologist will be responsible for ensuring that all decontamination protocols specified in the OPS are followed.

2.4 ENVIRONMENTAL MATERIAL HANDLING, LABELING, & DISPOSAL

WARP field operations will generate both liquid and solid environmental materials. Liquid materials include drilling fluids, decontamination and wash water, and residual groundwater. Solid materials include drill cuttings, removed casing, surface soils, disposable personal protective equipment (PPE), and plastic. Handling and disposal of these materials will be conducted in accordance with the following OPS:

- **FO.6, "Handling of Personal Protective Equipment"** – Applicable to personal protective equipment and plastic (i.e., visquene) used at work sites.
- **FO.7, "Handling of Decontamination Water and Wash Water"** – Applicable to decontamination and wash water.
- **FO.8, "Handling of Drilling Fluids and Cuttings"** – Applicable to drill cuttings, drilling fluids, surface soil, and residual groundwater displaced during well abandonment.
- **FO.10, "Receiving, Labeling, and Handling Environmental Material Containers"** – Provides guidance for procurement, labeling, and use of environmental material containers (i.e., drums).
- **Draft FO.23, "Management of Soil & Sediment Investigation Derived Materials (IDM)"** – Provides guidance for handling of soil and sediment from the point of generation through the characterization process and includes the handling of drums in which these materials are contained.
- **GT.11, "Plugging and Abandonment of Wells"** – Provides information on handling and disposal of removed casing and additional information on handling and disposal of displaced residual groundwater.

The field geologist will be responsible for proper handling of environmental materials at the work

sites, proper labeling of environmental material containers, and completion of required forms and documentation. The field supervisor will be responsible for coordinating the removal and transfer of all environmental materials from the project work areas to the designated transfer area.

Draft FO.23 "Management of Soil & Sediment Investigation Derived Materials (IDM)," describes the conditions in which annular materials will be contained in drums. Draft FO.23 is under review by the regulatory agencies and final approval is anticipated before the commencement of field operations. If the monitoring well to be abandoned is located in an IHSS or if field screening indicates that constituent concentrations are above the ambient levels as measured by field instruments, then annular material brought to the surface must be drummed. Annular material will also be drummed at the direction of the EG&G project manager or designee. Samples will be collected before containment of the annular material in drums.

The subcontractor field supervisor will ensure that the following duties are executed by subcontractor personnel:

- Arrange for the appropriate drums to be picked up.
- Ensure materials are not commingled (i.e., PPE with other solid wastes).
- Ensure drums are properly filled, labeled, and positioned in the field.
- Ensure all documentation is completed properly and a tracking system is implemented that shall account for each drum.
- Assist with periodic inspection drums issued by EG&G.
- Arrange for drum transfer to EG&G.

2.5 Field Sampling Plan

The Field Sampling Plan has been divided into two sections to meet the OU4 RCRA Facility Investigation/Remedial Investigation (RFI/RI) sampling and analytical requirements for work performed inside the PA and to meet the general sitewide requirements for work performed outside the PA. However, in both areas the objective for field sampling is to determine the presence and estimate the extent of certain chemical constituents and radionuclides in the unsaturated zone. Drilling and sampling during the installation of the replacement monitoring wells will be performed in accordance with GT.2, "Drilling and Sampling Using Hollow-Stem Auger Techniques." Sample labeling, handling, and shipping will be performed in accordance with FO.13, "Containerization, Preserving, Handling and Shipping of Soil and Water Samples."

All laboratory work will be done according to the U.S. EPA's Contract Lab Program (CLP) standards. The CLP-type analysis is outlined in the July 2, 1991 revision of the document entitled "EG&G Rocky Flats, General Radiochemistry and Routine Analytical Service Protocol (GRRASP)."

2.5.1 Field Sampling Outside the PA

Soil samples will be collected during the drilling of the replacement wells located outside of the PA and submitted for analysis of Target Compound List-Volatile Organic Analysis (TCL-VOA), selected radionuclides and Total Target Analyte List (TAL)-metals. Specific analytes of radionuclide analysis will include Gross Alpha Beta, Plutonium ^{239/240}, Americium ²⁴¹, Strontium ^{89/90}, Cesium ¹³⁷, Radium ^{226/228}. The protocol for VOA sampling is as follows:

- VOA samples will be collected in stainless steel circular sleeves inserted into the downhole end of the core barrel. The 0.25-ft long sleeve will be immediately capped with Teflon and plastic endcaps when it comes out of the borehole, then sealed with black electricians' tape.
- The first sample will be collected between 1.75-2.00-ft, then every four feet thereafter.
- Except for the first wet (i.e., saturated) sample, VOA sampling ceases when drilling intersects

the water table. It also ceases after the first sample into bedrock.

- A rad screen will be collected for each VOA sample in accordance with FO.18.

Composite samples for radionuclides and Total CLP-metals will be collected as follows:

- Composite samples are composed of metal and radionuclide samples collected from drill core that is scraped with a stainless steel spatula into a stainless steel bowl and homogeneously mixed.
- Samples will be collected in 6.0 foot intervals. If the interval to be sampled is less than 6.0 feet, then the composite sample will be collected from this remaining interval.
- Sampling will cease below the interval that intersects the water table. It will also cease after the sample interval intersects the bedrock.
- A rad screen sample will be collected for each composite sample collected in accordance with FO.18.

Duplicate and equipment blank QC samples will be collected according to instructions in GT.02. The sample frequency for duplicate and equipment blanks will be one-in-ten and one-in-twenty. Equipment Blank QC samples will be analyzed for TCL-VOA, gross alpha beta, and Total TAL-metals. Duplicate QC samples will be analyzed for Gross Alpha Beta, Plutonium ^{239/240}, Americium ²⁴¹, Strontium ^{89/90}, Cesium ¹³⁷, Radium ^{226/228}, and Total TAL-metals.

2.5.2 Field Sampling Inside the PA

Field sampling, including QC sample collection requirements, inside the PA will conform to the Field Sampling Plan described in the "Final Phase I RFI/RI Work Plan, Operable Unit 4, Solar Evaporation Ponds."

2.6 PERMITS

Permits and procedures for authorizing intrusive work at RFP are discussed in GT.10, "Borehole Clearing." Access permits are also required for work in some RFP restricted areas. The project-specific HASP will outline access permits required due to health and safety concerns.

Actions relating to the 15 wells located in the floodplains that are proposed for abandonment have been reviewed to maintain compliance with the National Environmental Policy Act (NEPA) and DOE has determined that the requirements of 10 CFR 1021 and 10 CFR 1022 have been met. Notice of floodplain/wetland involvement was published in the Federal Register on April 2, 1992. The Statement of Findings was published in the Federal Register on October 15, 1992.

2.7 FIELD COMMUNICATIONS

RFP field communications will follow protocols described in FO.11, "Field Communications." A short training session on the use of site telephones and radios will be conducted by EG&G. Communication protocols and emergency signals will be included in the training. In the event of an emergency, procedures outlined in the task-specific HASP and the RFP HASPP shall be followed.

A project office will be established in a trailer at RFP. This trailer is connected by telephone. Field teams will use two-way radio for communication with the field office and other field teams. The buddy system will be employed during all field activities (i.e., all work will be conducted in pairs or groups of personnel).

2.8 RECORDS AND REPORTS

Daily WARP field activity documentation shall entail completion by the site geologists of field forms provided in the OPS. Field data will be managed according to FO.2. In addition, field activity daily logs shall be maintained by the geologists. These logs will contain a chronological account of the day's activities, and shall include interpretations of the final subsurface conditions. Particular attention shall be given to documenting the quantity of grout used in each borehole or well casing and the total drilling depth. The groundwater level before abandonment shall be recorded, and any unusual conditions shall be documented. At the end of each day, a signed copy of the daily logs shall be presented to the field supervisor for review and filing plus weekly transmittal to EG&G.

A sample tracking spreadsheet will be maintained by the contractor for use in tracking sample collection and shipment. EG&G will supply the spreadsheet format and will stipulate timely reporting of information. These data will also be delivered to EG&G on 3.5-inch computer diskettes. Computer hardware and software requirements for contractors using government-supplied equipment will be furnished by EG&G. Computer and data security measures will also follow acceptable procedures outlined by EG&G.

Project reporting for WARP will consist of the following:

- **Daily Contact** – The field supervisor shall apprise the EG&G project manager or designee of project progress on a daily basis.
- **Weekly Reports** – During the course of field activities, weekly memos will be prepared by the field supervisor for EG&G summarizing the progress of the project and any problems encountered.
- **Data Reports** – Field data will be input to the Rocky Flats Environmental Database Systems (RFEDs) using a remote data entry module supplied by EG&G. Data will be entered on a 3.5-inch computer diskette and will be delivered to EG&G on a timely basis. Procedures for data

quality control, verification, entry into RFEDs, archiving, and security will follow FO.14.

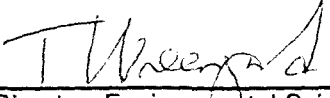
- **WARP Report** – A report will be prepared following completion of WARP which details the performance and results of the project.
- **Notification Letters** – Copies of well abandonment logs and forms for each abandoned well, along with a summary letter explaining the activities, will be delivered to EG&G.

ENVIRONMENTAL RESTORATION PROGRAM
Well Abandonment and Replacement Program
Fiscal Year 1993 Work Plan

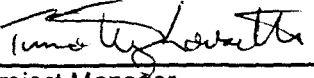
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Section No.:
Page:
Effective Date:

21000-WP-WARP.93
3.0, Rev. 0
1 of 2
2/1/93

Approved by:


Director, Environmental Science and Engineering

1, 15, 93


Project Manager

1, 8, 93

3.0 HEALTH AND SAFETY

Health and safety requirements for WARP field operations are provided in the HASPP and the task-specific HASP. HASPP is a program-wide document that addresses general, programmatic health and safety issues for RFP field work. HASP is a project-specific document developed by the subcontractor that addresses issues such as:

- Levels of Personal Protection,
- Overall Hazard Estimate for the Various Work Areas,
- Site Conditions and Material Characteristics, Including a Radiological Assessment,
- Work Area Control Zones,
- Decontamination,
- Emergency Procedures,
- Personnel Health and Safety Responsibilities, and
- Drilling Safety Protocols.

ENVIRONMENTAL RESTORATION PROGRAM
Well Abandonment and Replacement Program
Fiscal Year 1993 Work Plan

Manual:
Section No.:
Page:
Effective Date:

21000-WP-WARP.93
3.0, Rev.0
2 of 2
2/1/93

HASP incorporates elements of and takes precedence over HASPP. In addition, HASP will comply with Occupational Safety and Health Administration (OSHA) regulations defined in 29 CFR 1910.


The health and safety officer will be responsible for ensuring that all personnel performing or supporting project field operations are cognizant of all health and safety procedures. The site geologist will be responsible for ensuring that field personnel follow these procedures. EG&G will provide a contaminant characterization for each work area before commencement of work in that area.

ENVIRONMENTAL RESTORATION PROGRAM
Well Abandonment and Replacement Program
Fiscal Year 1993 Work Plan

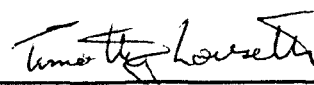
Manual:
Section No.:
Page:
Effective Date:

21000-WP-WARP.93
4.0, Rev. 0
1 of 12
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1, 8, 93

4.0 QUALITY ASSURANCE ADDENDUM

This section consists of the Quality Assurance Addendum (QAA) for the FY93 WARP. This QAA supplements the "Rocky Flats Plant Sitewide Quality Assurance Project Plan for CERCLA Remedial Investigation/Feasibility Studies (RI/FS) and RCRA Facility Investigations/Corrective Measures Studies Activities" (QAPjP). This QAA identifies the site-specific QA controls applicable to the well abandonment and replacement activities described in Section 2.0.

As stated previously, WARP consists of an annual maintenance program for RFP GMP. The primary objectives of WARP are to properly abandon groundwater monitoring wells and piezometers that are no longer viable or needed as part of GMP and to install replacement wells or piezometers at locations where a nonviable but useful (i.e., generates groundwater monitoring data that is used in GMP) well or piezometer is removed. The scope of the proposed FY93 WARP is described in Section 1.3.

4.1 ORGANIZATION AND RESPONSIBILITIES

The overall organization of EG&G Rocky Flats and ER, which is responsible for implementing the ER Program activities at RFP, is presented in Section 1.0 of the QAPjP. Functional responsibilities for the ER Program are also described in Section 1.0 of the QAPjP. The project-specific organization for the FY93 WARP is presented in Figure 1.4-1. The Project specific staffing and description of responsibilities were discussed in Section 1.4.

4.2 QUALITY ASSURANCE PROGRAM

The QAPjP was written to address QA controls and requirements for implementing ER Program activities, as required by the RFP Interagency Agreement (IAG). The content of the QAPjP was driven by DOE Order 5400.1, the RFP QA Manual (RF QAM), and the IAG. DOE 5400.1 and the RF QAM both require a QA program to be implemented based on American Society of Mechanical Engineers (ASME) NQA-1, "Quality Assurance Requirements for Nuclear Facilities." IAG specifies development of a QAPjP in accordance with the Environmental Protection Agency (EPA) QAMS-005/80, "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans." The basic format of the RF QAM, which consists of 22 broad quality requirements (QRs), was selected as the basis for both the QAPjP and subsequent QAAs. The elements of QAMS-005/80 are incorporated where appropriate. Figure 2-1 of Section 2.0 of the QAPjP illustrates where the 16 QA elements of QAMS-005/80 are integrated into the QAPjP and also into this QAA. Section 2.0 of the QAPjP also identifies other DOE Orders and QA requirement documents to which the QAPjP and this QAA are responsive.

The controls and requirements addressed in the QAPjP are applicable to WARP, unless specified otherwise in this QAA. Where sitewide actions are applicable to WARP, the applicable section of the QAPjP is referenced in this QAA. This QAA addresses any additional and project-specific QA controls and requirements that are applicable to WARP that may not have been addressed on a sitewide basis in the QAPjP. Many of the QA requirements specific to WARP are addressed through quality control (QC) measures described in the previous sections of this work plan. The appropriate section of the work plan where these QC measures are discussed are identified and referenced in this QAA.

4.2.1 Training

The minimum personnel qualification and training requirements that are applicable to EG&G and subcontractor staff for the RFP ER Program activities are addressed in Section 2.0 of the QAPjP. Personnel health and safety training requirements are identified in the WARP HASP. In addition

to QA and health and safety training, all EG&G and subcontractor staff working on WARP shall be trained in and familiar with the EG&G Rocky Flats EM OPS that are applicable to their assigned tasks and this work plan. Personnel training assignments and evidence of completion of training shall be recorded with verifiable documentation and be submitted to the WARP Project Manager before initiating the FY93 WARP activities described in this work plan. EG&G and subcontractor personnel shall also be qualified to perform the tasks they have been assigned. Personnel qualifications shall be documented, with documentation of qualifications verified by the WARP Project Manager in accordance with EM administrative procedure 3-21000-ADM-02.02, Personnel Qualifications.

4.2.2 Quality Assurance Reports to Management

A QA summary report will be prepared at the conclusion of the FY93 WARP activities by the EG&G ER QA Services Manager. This report will include a summary of any field operation, sampling oversight inspections and surveillance conducted, and a report on data verification/validation results, as appropriate.

4.3 DESIGN CONTROL & CONTROL OF SCIENTIFIC INVESTIGATIONS

4.3.1 Design Control

The WARP Work Plan establishes the requirements and specifications for well and piezometer abandonment and replacement and collection of subsurface soil samples from the drilling and installation of replacement wells and piezometers. As such, the FY93 WARP Work Plan is considered the environmental investigation control plan for the proposed WARP field activities.

4.3.2 Data Quality Objectives

As stated previously, WARP is a maintenance program for the RFP GMP. Specific objectives of WARP are to (1) properly abandon nonviable wells and piezometers, (2) install replacement wells and piezometers at locations of nonviable wells or piezometers where groundwater monitoring data is still needed, and (3) to collect subsurface soil samples from drilling replacement wells that will be analyzed to assist other projects determine presence and extent of contamination.

The primary data users and decisions makers of WARP include the technical staff of EG&G Rocky Flats and subcontractors that are responsible for implementing WARP activities. This includes the technical staff of EG&G Rocky Flats, subcontractors, DOE, EPA, and CDH that are responsible for collecting, reviewing, and interpreting data associated with the RFP GMP. Secondary decision makers include other project managers who will use analytical data from samples collected during the drilling of replacement wells. This will help them determine the presence and extent of contamination associated with the projects that are their responsibility.

Existing GMP data was reviewed and evaluated to determine which of the existing wells and piezometers need to be abandoned and replaced. This discussion was presented in Section 1.3. Information from existing wells and piezometers was also used to select the zones of completion and projected depths for replacement wells and piezometers (See Table 2.2-1).

Based on the existing information and the objectives of WARP, data is needed to prevent groundwater and soil contamination through wells and piezometers, prevent intermixing of subsurface water through the well, conserve the hydraulic characteristics of hydrogeologic units, and minimize physical and contamination hazards to workers and the environment. The type of data to be generated during implementation of WARP will consist solely of field data. Laboratory analytical data will not be generated as a result of implementing the activities addressed in this Work Plan. Analyses of subsurface soil samples to be collected during drilling of replacement wells (See Table 2.2-1) will be made available for analyses under other ER project work plans. For instance, the Phase I RCRA RFI/RI Work Plan for OU4 for those replacement wells located inside

the PA.

The field data to be generated during implementation of WARP meets EPA's definition of analytical Level I data (i.e., field screening, analysis, or measurements using portable instruments). The quality of field data will be controlled by adhering to the EM operating procedures identified in Section 2.0 and summarized below. Specifying indicators of data quality (i.e., precision, accuracy, and completeness) is not necessary for determining the quality of the field data to be generated.

The WARP field measurement data will include wellbore depths and diameters, depths to bedrock and water level in wells and piezometers, and depth of soil samples. These measurements will be made and controlled in accordance with instructions contained in operating procedure 5-21000-OPS-GT.2, "Drilling and Sampling Using Hollow Stem Auger Techniques." Drilling cores from borings for replacement wells/piezometers will be logged according to 5-21000-OPS-GT.1, Logging Alluvial and Bedrock Material. Electromagnetic and/or ground penetrating radar (GPR) measurements will be made of all wellbore locations for replacement wells as part of surface geophysical surveys conducted to detect areas where subsurface metal objects might be located. The use of geophysical equipment used to generate electromagnetic or GPR data will be in accordance with instructions specified in 5-21000-OPS-GT.10, "Borehole Clearing." Radiation contamination screening measurements will be made at all existing and proposed well and piezometer locations in accordance with instructions specified in 5-21000-OPS-FO.16, "Field Radiological Measurements." Radiation and organic vapor screening measurements will also be made during drilling and sampling activities. Organic vapor measurements will be made in accordance with instructions specified in 5-21000-OPS-FO.15, "Photoionization Detectors (PIDS) and Flame Ionization Detectors (FIDS)."

4.3.3 Sampling Locations and Sampling Procedures

The EG&G EM Operating Procedures (5-210000-OPS) that provide instructions for implementing the various aspects of each of these basic activities and equipment decontamination and materials handling are identified in Section 2. The OPS that provides field controls for the collection of subsurface soil samples from drilling replacement wells is 5-21000-OPS-GT.2, "Drilling and Sampling Using Hollow-Stem Auger Techniques."

4.3.4 Analytical Procedures

The subsurface soil samples that are collected for analyses of TCL volatile organic compounds (VOCs), TAL metals, and radionuclides of interest listed in the RFP OU4 Work Plan (EG&G, 1992), shall be analyzed following analytical methods and procedures adopted for use by the EPA CLP. These methods and procedures are specified for use by contractor laboratories analyzing RFP environmental samples in the EG&G Rocky Flats GRRASP.

4.3.5 Equipment Decontamination

Drilling and sampling equipment shall be decontaminated between drilling and sampling locations in accordance with OPS-FO.04, "Heavy Equipment Decontamination", and OPS-FO.03, "General Equipment Decontamination."

4.3.6 Quality Control

Field sampling quality control will consist of collection and analysis of duplicate soil samples at the rate of 1 per 20 samples and preparation and analysis of an equipment rinsate blank for every 20 soil samples collected. Analytical laboratory QC for soil sample analyses shall be as specified in GRRASP. Duplicate samples shall be analyzed for the same analytes of interest as regular samples.

Equipment blanks shall be analyzed for the same VOCs and metals as regular samples; however, radionuclide analysis of equipment blanks shall be limited to gross alpha, beta, gamma, and tritium.

4.3.7 Quality Assurance Monitoring

To verify the overall quality of the WARP field activities, field oversight inspections will be conducted during well abandonment, replacement, and sampling activities.

4.3.8 Data Reduction, Validation, and Reporting

Field data generated during implementation of the WARP field activities shall be recorded on field data forms provided in the applicable operating procedures. Verification, validation, reduction, and reporting of field data shall be accomplished according to the instructions specified in 5-21000-OPS-FO.14, "Field Data Management." Reduction, validation, and reporting of analytical data generated from analysis of subsurface soil samples shall be in accordance with specifications applicable to the specific RFP ER project for which the data will be used (e.g., analytical data from subsurface soil samples taken from wells/piezometers replaced inside the PA shall be provided to the EG&G OU4 Project Manager and shall be validated and reported as specified in the OU4 Work Plan).

4.4 PROCUREMENT DOCUMENT CONTROL

Procurement documents for items and services, including services for conducting field sampling and analysis shall be prepared, handled, and controlled in accordance with the requirements and methods specified in Section 4.0 of the QAPjP.

4.5 PLANS, INSTRUCTIONS, PROCEDURES, AND DRAWINGS

This WARP Work Plan describes the well abandonment, replacement, and field sampling activities to be performed. This WARP FY93 Work Plan will be reviewed and approved in accordance with the requirements for plans, instructions, procedures, and drawings outlined in Section 5.0 of the QAPjP.

Existing EM Operating Procedures applicable to WARP were identified in Section 2. These procedures have been developed and approved as required by Section 5.0 of QAPjP.

Any changes or revisions to approved operating procedures and the WARP Work Plan shall be documented through preparation of Document Change Notices (DCNs), which will be prepared, reviewed, and approved in accordance with requirements specified in Section 5.0 of the QAPjP.

4.6 DOCUMENT CONTROL

The following documents will be controlled in accordance with Section 6.0 of the QAPjP:

- Well Abandonment and Replacement Program Work Plan, FY93
- The RFP QAPjP
- EM Operating Procedures specified in the WARP FY93 Work Plan

4.7 CONTROL OF PURCHASED ITEMS AND SERVICES

Subcontractors that provide services to support WARP will be selected and evaluated as outlined in Section 7.0 of the QAPjP. This may include pre-award evaluation/audit of proposed subcontractors as well as periodic assessment of the acceptability of contractor performance during the program.

Any items or materials that are purchased for use in WARP that have the potential to affect the quality of samples or subsequent groundwater monitoring data should be inspected upon receipt.

4.8 IDENTIFICATION AND CONTROL OF ITEMS, SAMPLES, AND DATA

Soil samples collected during the drilling of replacement wells shall be identified and handled, containerized, shipped, and stored in accordance with EM Operating Procedure 5-21000-OPS-FO.13, "Containerizing, Preserving, Handling, and Shipping of Samples." Any additional sample identification or handling, shipping, or storing requirements for these samples will be specified by the project managers of other ER projects that may use the analytical results from these samples.

Sample chain-of-custody, as defined in Section 8.0 of the QAPjP, will be maintained through the application of OPS-FO.13 and Section 8.0 of the QAPjP.

4.9 CONTROL OF PROCESSES

The overall processes of generating field data and collecting samples requires control. The processes are controlled by adhering to the WARP Work Plan and the operating and sampling procedures referenced.

4.10 INSPECTION

Inspection of well abandonment and drilling and sampling activities will be conducted to provide independent verification of compliance with applicable Operating Procedures and the WARP Work Plan. These inspections will be conducted in accordance with Section 10.0 of the QAPjP.

4.11 TEST CONTROL

Test controls, as defined in Section 11.0 of the QAPjP are not applicable to the well abandonment, replacement, and sampling activities described in this Work Plan.

4.12 CONTROL OF MEASURING AND TEST EQUIPMENT (M&TE)

The measuring equipment used to generate field data are identified in the applicable operating procedures. This equipment will be controlled, including any necessary calibrations and maintenance requirements, as specified in the applicable operating procedures and manufactures instructions. M&TE that require calibration, measuring equipment such as downhole measuring tapes do not require calibration, shall have a file that contains the following information:

- Specific Model and Instrument Serial Number,
- Operating Instructions,
- Routine Preventative Maintenance Procedures, Including a List of Critical Spare Parts To Be Provided or Available in the Field,
- Calibration Methods, Frequency, and Description of the Calibration Solutions, and
- Standardization Procedures (i.e., Traceability to Nationally Recognized Standards).

4.13 HANDLING, STORAGE, AND SHIPPING

Samples shall be packaged, transported, and stored in accordance with EM Operating Procedure 5-21000-OPS-FO.13.

4.14 STATUS OF INSPECTION, TEST, AND OPERATIONS

The status of wells and piezometers, as concerns proper abandonment and installation of replacement wells or piezometers, will be documented by the WARP Project Manager.

4.15 CONTROL OF NONCONFORMANCES

The requirements for the identification, control, evaluation, and disposition of deficiencies in program and procedural requirements and nonconforming items, samples, and data will be implemented as specified in Section 15.0 of the QAPjP. Deficiencies and nonconformances identified by the implementing contractor(s) shall be submitted to EG&G for processing as outlined in the QAPjP and EM Administrative Procedure 3-21000-ADM-15.01.

4.16 CORRECTIVE ACTION

The requirements for the identification, documentation, and verification of corrective actions for conditions adverse to quality will be implemented as outlined in Section 16.0 of the QAPjP. Conditions adverse to quality identified by the implementing contractor shall be documented and submitted to EG&G for processing as outlined in the QAPjP.

4.17 QUALITY ASSURANCE RECORDS

Field QA records will be controlled in accordance with OPS-FO.02, "Field Document Control." Field QA records include the OPS data forms that are completed as a result of implementing the WARP field activities and copies of field logbooks. This WARP Work Plan and any subsequent changes or revisions are also considered QA records.

4.18 QUALITY VERIFICATION

The requirements for the verification of quality shall be implemented as specified previously in Sections 4.3.7 and 4.10 of this Work Plan.

A Readiness Review shall be conducted by the ER QA Support Manager before implementing the field activities described in Section 2.0. The readiness review will determine if all activity prerequisites have been met that are required to begin work. The applicable requirements of the QAPjP and this WARP Work Plan will be addressed.

4.19 SOFTWARE CONTROL

The requirements for the control of software are not applicable to the WARP field activities.

ENVIRONMENTAL RESTORATION PROGRAM
Well Abandonment and Replacement Program
Fiscal Year 1993 Work Plan

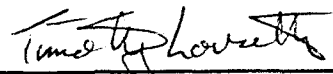
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21000-WP-WARP.93
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1 of 1
2/1/93

Approved by:


Director, Environmental Science and Engineering

1, 15, 93


Project Manager

1, 8, 93

5.0 REFERENCES

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Appendix A – Acronym List

ASME	American Society of Mechanical Engineers
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Lab Program
DCN	Document Change Notice
DOE	Department of Energy
EMD	Environmental Management Division
EPA	Environmental Protection Agency
ERM	Environmental Restoration Management
FIDS	Flame Ionization Detectors
FY	Fiscal Year
GMP	Groundwater Monitoring Program
GPR	Ground Penetrating Radar
GRRASP	General Radiochemistry and Routine Analytical Service Protocol
H&S	Health and Safety
HASP	Health and Safety Plan
HASPP	Health and Safety Program Plan
IAG	Interagency Agreement
IDM	Investigation Derived Materials
IHSS	Individual Hazardous Substance Site
M&TE	Measuring and Test Equipment
MDF	Main Decontamination Facility
NEPA	National Environmental Policy Act
OPS	Standard Operating Procedure

OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PA	Protected Area
PIDS	Photoionization Detectors
PPE	Personal Protective Equipment
PVC	polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
QAA	Quality Assurance Addendum
QAPjP	Quality Assurance Project Plan
QATP	QA Task Plan
QRs	Quality Requirements
RCRA	Resource Conservation and Recovery Act
RF QAM	RFP QA Manual
RFED	Rocky Flats Environmental Database
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RFP	Rocky Flats Plant
RI/FS	Remedial Investigation/Feasibility Studies
SOW	Statement of Work
TAL	Target Analyte List
TCL	Target Compound List
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compounds
WARP	Well Abandonment and Replacement Program

U.S. Department of Energy

Rocky Flats Plant

WARP Location Map for FY93

- Wells to be abandoned
- Replacement wells
- Paved roads
- Streams, ditches, and other drainage features
- Rocky Flats boundary
- Buildings
- Lakes/Ponds

Map Scale = 1:10000
1 inch = 1666 feet

State Plane, Colorado Projection
Zone 10N

Prepared by:

EG&G ROCKY FLATS

Rocky Flats Plant
P.O. Box 464
Golden, Colorado 80402-0464

